Faba Bean Production in Saskatchewan

FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

History and Production

The faba bean *(Vicia faba minor)* is an ancient, cultivated, small-seeded relative of the garden broadbean *(V. faba major)*. The faba bean is grown mainly in Europe where it is primarily used as a livestock feed. Britain, where both winter and spring types are grown, has been the largest European producer of faba bean.

The broadbean is produced in China, Europe, the Middle East, North Africa and South America and is consumed mainly as a vegetable. It can also be found growing in many vegetable gardens in Canada.

Commercial production of faba bean in western Canada first occurred in 1972 and the area under production has fluctuated widely since then.

Uses

Originally, the main interest in faba bean was as an on-farm, protein supplement for livestock feeding. The fababean has a protein content of 24-30 percent. Feeding studies have shown that faba bean can be a good poultry feed, if supplemental methionine is added. It can replace soybean meal in rations for pigs weighing 80 lbs and over, as well as for calves, lactating dairy cows, beef cattle and sheep.

The potential for using the faba bean as silage is good. Studies have shown growing dairy heifers and beef cattle gaining on faba bean silage at the same rate as animals on grass-legume silage. Dairy cows in heavy lactation have also performed well on faba bean silage.

For the present, large acreages are recommended only when a grower has a contract to market the crop or intends to utilize the faba bean as a protein supplement or silage in livestock feeding.

Soils and Rotation

Faba bean is best adapted to the moister growing areas of the province and does best under relatively cool growing conditions. Hot, dry spells will result in wilting of the plants and may reduce seedset. Therefore, faba bean should be grown with caution in the brown soil zones and on droughty, light-textured soils — unless irrigation is available, as they respond very well to irrigation.

Faba bean should not be grown on the same field more than once every three to five years and should not follow oilseeds or other legume crops in the rotation because of the danger of a rapid increase in soil-borne diseases. Tests in Saskatchewan suggest faba bean should be grown on summerfallow, but satisfactory yields have been obtained on stubble land.

Seedbed Preparation and Seeding

Faba bean should be seeded 8 cm (3 inches) deep into a firm seedbed. Unnecessarily deep cultivation for preparation of the seedbed should be avoided to prevent excess drying of the soil. Because faba bean take up approximately their own weight in water before germinating, a dry seedbed will result in prolonged and uneven emergence.

One of the advantages of the faba bean is its ability to withstand heavy frosts which may occur in late May or early June. Because of this, and to avoid maturity problems, seeding is recommended by May 10. When the ground is thawed, mid-April seeding is suitable.

Recent studies at the Crop Development Centre have indicated that seeding rates for faba bean may not need to be as high as previously recommended. Tests on the cultivar Outlook at two locations over two years revealed that satisfactory yields could be obtained by seeding this cultivar at 100 kg/ha in 15 cm (6 inch) rows. This is roughly equivalent to 4 seeds per linear meter. For larger seeded cultivars of faba bean this seeding rate would have to be adjusted upward. With the Chinese Broadbean, which has a seed size 2.5 x larger than faba bean, a seeding rate of 325 kg/ha would be needed to achieve a plant population of 5 seeds per linear meter.

Because faba bean seeds are very large, a seeder with seedcups having large seed cells must be used to prevent seed cracking. Externally force fed seedcups of the Siedersleben type (found on Morris and Melroe seeders) have been found to produce the least seed damage to both faba bean and broadbean. This is because these systems have studded or flanged rollers and generally have a number of interchangeable rollers or wheels that are selected on the basis of seed size. Externally force fed seedcups of the Hoozier type (fluted roller) with adjustable feed gates are the next best choice for these crops. International Harvester and John Deere are examples of this type and have proven acceptable in tests at the Crop Development Centre.

Faba bean should not be planted as a mixture with cereal grains since it does not compete well with other plants.

Variety	Yield as a % of Outlook	Days to mature	100 seed wt. (gms)	Minimum seeding rate (kg/ha)
Outlook	100	109	365	100
Aladin	106	112	420	120
Encore	103	110	365	100
Orion	68	102	350	100
Pegasus	100	111	380	100

Growers may want to experiment with faba bean and barley planted at the appropriate dates, in strips and harvested across the strips for a mixed barley-fababean silage.

The Chinese Broadbean, which has a 1000 seed weight of 850 gms, is another type that may be contracted for growing in the province. If a contract is available some thought should be given to producing the Chinese Broadbean as it is significantly earlier than the faba bean varieties and is equal in yield to Outlook. The negative features of the Chinese Broadbean relate to its large seed size. The seeding rate required is 325 kg/ha and a suitable seed drill would be required to accommodate this large irregularly shaped seed.

Seed Inoculation

Faba bean is a legume and thus is able to use nitrogen from the air provided the seed is inoculated with the proper bacteria just prior to planting. Faba bean requires a special strain of inoculum to ensure effective inoculation. Inoculants used for alfalfa, peas, and clovers are not effective on faba bean. Be sure the inoculum is not out-dated; follow the instructions on the package, and apply no more than 24 hours before seeding. (For more details on seed inoculation, see the Saskatchewan Agriculture Publication on "Legume Inoculation."

Faba bean is one of the more efficient fixers of atmospheric nitrogen, and for this reason much of the advantage of growing faba bean will be lost unless the seed is properly inoculated. Unlike pea and lentil, faba bean will fix nitrogen throughout the growing season.

Fertilizers

Nitrogen application is not recommended, since faba bean has shown no consistent response to nitrogen fertilization. Soil testing is recommended prior to planting for specific recommendations for other nutrients. However, if soil test results are not available, an application of 22-34 kg/ha of phosphate (P_2O_5) is recommended. Rates of P_2O_5 up to 20 kg/ha can be seed placed. Higher rates should be side-banded.

Weed Control in Faba Bean

Weed control measures are essential for successful faba bean production. Faba bean competes poorly with the common annual grass and broadleaved weed species (Table 1), particularly when the faba bean is in the seedling stage or under conditions of moisture stress.

A. Cultural Weed Control

Cultural weed control generally produces highly variable results, with the level of weed control achieved depending primarily upon environmental conditions and stage of weed growth. Appropriate weed control during summerfallow years (particularly for perennials), careful selection of a clean seedbed, inclusion of a shallow tillage operation in problem areas prior to seeding, and use of clean seed are important points to note when planning faba bean production.

One or two pre-emergent harrowing operations following seeding should be considered a standard practice for firming and grooming the seedbed, and improving the kill of winter annuals only partially uprooted by seeding tillage operations. In contrast, post-emergent harrowing must be viewed as a **drastic** measure and should be resorted to only if chemical weed control is not available or has proven inadequate. This procedure involves harrowing crosswise to the direction of seeding when the faba bean plants are 5 to 15 cm in height to remove annual weed seedlings.

Harrowing should be avoided during emergence of the faba bean to prevent mechanical damage in the very early seedling stage. Harrowing should also be avoided during damp weather or conditions of heavy dew to prevent the spread of fungal diseases such as *Ascochyta* blight, *Sclerotinia* stem blight and *Fusarium* root rot. The best weed control will be obtained by harrowing on a dry, sunny day.

B. Chemical Weed Control

Chemical weed control usually provides effective and consistent results. For the soil-incorporated products the advantages from fall application include more uniform distribution of the active materials for improved weed control and crop tolerance, conservation of soil moisture by reduction of spring tillage operations, the potential for earlier seeding, and more efficient timing of labor inputs for herbicide application and incorporation. The primary disadvantage of fall application of soil-incorporated herbicides is increased susceptibility of the treated fields to soil erosion due to reduction of crop residues and loosening of the soil surface. Granular formulations are recommended for fall application into stubble, as liquid formulations may be bound by the crop residues, resulting in poor weed control.

For post-emergence products, operations with a field sprayer should be conducted before the faba beans reach 20 cm to minimize mechanical damage. In addition, weeds are generally more susceptible and faba bean more tolerant to herbicides applied at an early growth stage.

Careful planning of rotations will permit a balanced attack on the weeds. The different products available for use in faba bean and cereal crops can be used to complement each other,

thereby controlling a wide spectrum of weeds and ensuring that no weed species goes unchecked for more than a single season. Fields treated with TORDON 202C should NOT be seeded to faba bean for a minimum of 5 years. Carryover of picloram may necessitate seeding an indicator area to faba bean 1 year prior to commercial cropping as a test for residual activity. Damage to pulse crops may result when areas treated with other residual herbicides such as GLEAN, ALLY or ASSERT are seeded to faba bean. Follow label re-cropping restrictions when growing faba bean after using these products. Areas of dense perennial weed growth should be avoided or controlled with spot treatments of non-selective herbicides such as ROUND-UP where the crop is sacrificed to control patches of thistle or quackgrass.

Several herbicides are registered for use in faba bean to control most of the common weed species. Check the literature provided in weed control publications or consult your dealer for more specific details regarding the use of these herbicides, since only a brief description outlining each product is listed below. Frequently, a combination of herbicides will be required to provide the desired control of both grass and broadleaf weeds during the cropping season. Precautions should always be taken to carefully read and exactly follow the label recommendations for each herbicide, as these may differ from the more familiar applications in cereals and oilseeds. For more details review the annual publication, "Chemical Weed Control in Cereal, Oilseed, Pulse and Forage Crops."

The following herbicides are presently registered for use in faba bean in Sasktchewan.

Basagran
Edge
Hoe Grass
Metribuzin
Trifluralin

Although insufficient data are available to date, experiments have indicated that other products show promise for control of specific weed problems in faba bean. These non-registered compounds should not be used since the responsibility falls completely upon the grower in the event of crop damage, illegal residues in the seed or inadequate weed control. Producers may obtain information on the current status of herbicide recommendations and weed control procedures by consulting the annual publication "Chemical Weed Control in Cereal, Oilseed, Pulse and Forage Crops" available from Sask. Rural Development, Sask. Ag and Food or by contacting the Crop Development Centre, University of Saskatchewan, Saskatoon, S7N 0W0.

Diseases

There are a number of diseases that may decrease the yield and quality of a faba bean crop. Only seed that has been laboratory-tested and found to be essentially free of disease should be purchased for seeding. If seed-borne diseases are suspected in your own seed stocks, a fungicide seed treatment should be used that is not destructive to the inoculant (e.g., Thiram).

Asochyta blight is a seed-borne disease which causes stem, leaf and pod spotting. In severe infections, beans developing in the pods become discolored and shrivelled.

Sclerotinia stem blight, which is common in sunflowers, rapeseed, and peas, and *Fusarium* root rot, which attacks many legumes and oilseed crops, may become a problem in faba bean. therefore faba bean should follow a cereal crop in the rotation rather than an oilseed or legume crop.

Bean yellow mosaic virus has also been reported on faba bean in prairie Canada.

Insects

Insects have not been a problem in faba bean to date. Three species of carragana blister beetle will attack faba bean, but their damage is localized in a field and control measures have not been found to be necessary.

Harvesting

In the dry climate of the prairies, faba bean will shatter if left standing until full maturity. The crop should be swathed when about 25 percent of the plants in a field have the lowest one or two pods turning color. At this stage the moisture content of the crop is fairly high and this will mean a fairly long period of drying in the swath. Therefore, a fairly light swath should be laid and in heavy stands this may mean only a partial cut if a large-sized swather is used. A consequence of the lighter seeding rates mentioned in this publication is there will be less stubble for the swath to sit on and therefore pickup of the swath may be more difficult.

In combining, maximum concave clearance and reduced cylinder speed (300 - 500 rpm) are recommended to reduce splitting and cracking of beans. Combine augers and grain loaders should be operated at low speeds to avoid splitting. Consideration should be given to combining in the early morning when the moisture content of the seed is higher and therefore less cracking will be likely to occur.

Drying

In mechanically drying large-seeded crops like faba bean, the outside area of the seed will dry but the inner core may remain damp. If the drying is carried on too long, this will lead to severe cracking of the seed. If drying is necessary, a maximum temperature of 32°C is recommended. Drying in two stages, with a day between operations, is suggested if more than 5 percent moisture is to be removed. Sixteen percent moisture is the maximum recommended for safe storage.

ADDITIONAL INFORMATION SOURCES

Legume Inoculation; Saskatchewan Agriculture and Food (fact-sheet)

Chemical Weed Control in Cereal, Oilseed, Pulse and Forage Crops; Saskatchewan Agriculture and Food (annual)

General Recommendations for Fertilization in Saskatchewan; Saskatchewan Agriculture and Food

Varieties of Grain Crops for Saskatchewan; Agriculture Development Fund

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